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ABSTRACT

Prior to 1979, DeKalb Community College (DCC) developed placement levels from Scholastic Aptitude Test (SAT) scores as criteria for admissions to degree-granting programs. When this procedure proved inadequate for degree admissions and student placement, DCC began generating placement levels on the basis of the Reading, English, and Mathematics (REM) test, which is composed of the Nelson-Denny Reading Test, the Test of Standard Written English, and a locally developed Mathematics Placement Test (MPT). As the Georgia State Department of Education's guidelines for degree-granting high technology programs designate SAT scores as criteria for admission, a study was conducted to compare REM placement levels with SAT scores. Using Pearson correlation coefficients, and a regression equation, placement levels and SAT scores were compared for 1,090 DCC students under 21 years of age who were enrolled in spring 1983. The study found significant correlation for total SAT scores and total REM placement levels, for SAT scores and combined reading and English placement levels, for SAT scores and individual reading and English placement levels, and for SAT mathematics scores and MPT placement levels. Further research was recommended to: (1) compare REM and SAT scores, (2) report from a more restricted universe, and (3) develop a scattergram and regression equation to predict REM scores from SAT scores and SAT scores from REM scores. (LL)

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The DeKalb REM Test Placement Levels and the SAT: Concurrent Validity

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The DeKalb REM Test Placement Levels and the SAT: Concurrent Validity

Abstract

The study investigated the extent that DeKalb Community College (DCC) admission placement levels compare with Scholastic Aptitude Test (SAT) scores. It was prompted by concerns from DeKalb Area Vocational-Technical School, the occupational unit of DCC, which noted that the State of Georgia Department of Education guidelines for degree granting high technology programs designate SAT scores as criteria for admissions, whereby DCC designates placement levels generated by the REM Test as criteria for admissions. The concerns buttressed recommendations previously made by DCC for correlation studies on placement of students.

The 1090 cases used for statistical treatment in the study were retrieved on computer tape by the DCC Administrative Computing Center from the Spring Quarter 1983 Enrollment Files. The cases represent DCC students 20 years old and under from all segments and campuses of the institution who had taken the REM Test and the SAT. Statistical procedures included the Pearson product-moment correlation coefficient, the Spearman Rho, and Multiple Regression. An SPSS computer run was executed at Georgia Institute of Technology's Institutional Studies.

The results showed correlation coefficients for SAT scores and Combined Reading and English (.71), Reading (.64), English (.63), and Mathematics (.65), all at the .001 significance level. This was important for Mathematics because it established the first test of statistical validity related to the Mathematics Placement Test, which is noted as an integral part of the REM Test. It was concluded that there is a significant relationship between REM placement levels and SAT scores of DCC students. Concurrent validity between REM placement levels and SAT scores was thereby established.

It was recommended that replication of the study be made for further verification of the results. Such replication should include a comparison of REM Test scores with SAT scores, the use of a more restricted universe, and the development of a scattergram and regression equations to predict REM scores and SAT scores both ways.

The DeKalb REM Test Placement Levels and the SAT: Concurrent Validity

Introduction

The purpose of this study was to compare DeKalb Community College (DCC) admission placement levels with Scholastic Aptitude Test (SAT) scores. It was felt that the study could serve to justify alternative admissions criteria established by DCC in its efforts to appropriately place students for suitable progress in degree programs. The study was conducted by the Office of Research and Planning.

The study emanated from DeKalb Area Vocational Technical School (DAVTS), the occupational unit of DCC, and its concern for the State of Georgia Department of Education admission guidelines for degree granting high technology programs. These guidelines designate SAT scores as criteria for degree program admissions whereby DCC designates placement levels for degree program admissions. DAVTS, a pilot school for high technology programs, queried if there was concurrent validity between SAT scores and the DCC placement levels. Moreover, the College-Wide Committee on Testing, Placement, and Advisement had previously recommended correlation studies on placement.

Foundations of DCC placement levels

Placement levels of DCC students are generated by raw scores derived from the DCC REM Test. The REM Test is a combination of Reading, English, and Mathematics selected from three different sources. The Reading portion is the Nelson-Denny Reading Test, a nationally recognized instrument consisting of reading comprehension and vocabulary. The English portion is the Test of Standard Written English (TSWE) which is the multiple choice grammar test section of the SAT. However, the Mathematics portion is the locally developed Mathematics Placement Test (MPT).

Success of the MPT

The MPT was developed by the DCC Mathematics Department and is generally accepted as being more adequate than SAT Mathematics scores as a placement instrument for degree enrolled students. During the Spring Quarter of 1979 the Mathematics Department field-tested the instrument, and in the Winter Quarter of 1981 a follow-up study of DCC students enrolled in MAT 131 College Algebra I was conducted. Although these efforts justified the MPT as a suitable placement instrument proven useful over time, the MPT lacks tests of validity or reliability with statistical significance. An important dimension of this study was to investigate the concurrent validity of the MPT with its SAT counterpart. Concurrent validity can be inferred in the presence of a collection of significant correlation coefficients (Standards For Educational & Psychological Tests, 1974).

Function of REM placement levels

REM placement levels generated by scores on the two-hour long REM Test function to place students in appropriate courses of Reading, English, and Mathematics. The three-hour long SAT has no designated comparable function. Figure 1 shows the basic placement levels and the courses wherein they place students. Reading and English have four placement levels (R1 through R4 and E1 through E4), while Mathematics has five placement levels (M0 through M4).

Figure 1. Basic DCC REM Placement Levels and Their Course Alignments

REM Placement Level	Course	
Reading 1 (R-1)	RE 98	Reading Skills
Reading 2 (R-2)	RE 99	Reading/Study Skills
Reading 3 (R-3)	RE 99	Reading/Study Skills
	RE 101	Advanced Reading and Communications Skills
Reading 4 (R-4)	Reading Exempted	
English 1 (E-1)	ENG 98	Basic Composition
English 2 (E-2)	ENG 99	Pre-College Composition
English 3 (E-3)	ENG 101	Composition And Rhetoric
English 4 (E-4)	ENG 201	Advanced Composition and Rhetoric
Math 0 (M-0)	MAT 96	Basic Mathematics
Math 1 (M-1)	MAT 97	Beginning Algebra
	MAT 100	Applied Mathematics
Math 2 (M-2)	MAT 98	Intermediate Algebra
	MAT 111	College Mathematics I
Math 3 (M-3)	ENT 105	Algebra
	MAT 111	College Mathematics I
	MAT 121	Decision Mathematics I
	MAT 131	College Algebra I
Math 4 (M-4)	*ENT 115	Trigonometry
	*ENT 125	Analytical Geometry and Calculus
	*MAT 132	College Algebra II and Trigonometry
	*MAT 203	Calculus And Analytic Geometry

*Require Additional Testing

Placement conversion of the REM Test

The Reading portion of the REM Test consists of 100 vocabulary and 36 comprehension items whose raw scores are converted to percentiles which are then translated into REM placement levels. The English portion consists of 50 items whose raw scores are converted to standard scores which are then translated into REM placement levels. The Mathematics portion consists of 50 items whose raw scores are directly translated into REM placement levels. Figure 2 shows the conversion scale for the Reading, English, and Mathematics portions of the REM Test.

Figure 2. Placement Level Conversion Scale for REM Test Scores

Raw Scores	Percentiles	Standard Converted Scores	Placement Level
72-136	47-99		Reading 4 (R-4)
70-71	44-46		*Reading 3 (R-3)
52-69	18-43		Reading 2 (R-2)
0-51	1-17		Reading 1 (R-1)
39-50		55-60	English 4 (E-4)
27-38		42-54	English 3 (E-3)
20-26		34-41	English 2 (E-2)
7-19		20-33	English 1 (E-1)
44 and above			Mathematics 4 (M-4)
34-43			Mathematics 3 (M-3)
28-33			Mathematics 2 (M-2)
21-27			Mathematics 1 (M-1)
20 and below (if seven of the first twelve items are correct the student is placed in M-1)			Mathematics 0 (M-0)

*discontinued since the generation of data in this study. Raw scores of 70-71 now translate to R-2 level.

Former DCC usage of SAT scores

Prior to 1979 DCC developed placement levels derived from SAT scores as criteria for admissions to degree granting programs. This procedure proved to be inadequate for degree admissions and placement of students. The former SAT levels and the courses wherein they placed students are shown in Figure 3.

Figure 3. Former DCC SAT Placement Level Scores and Their Course Alignments

SAT Placement Level Scores	Course
580 and above	ENG 101 Composition and Rhetoric ENG 201 Advanced Composition and Rhetoric
410-579	ENG 101 Composition and Rhetoric
341-409	ENG 99 Pre-College Composition RE 99 Reading/Study Skills
340 and below	ENG 98 Basic Composition RE 98 Reading Skills
600 and above	MAT 203 Calculus and Analytic Geometry (with Math Department permission)
475-599	MAT 101 (now MAT 131 College Algebra I) MAT 111 College Mathematics I MAT 121 Decision Mathematics I
375-474	MAT 98 Intermediate Algebra MAT 111 College Mathematics I
374 and below	MAT 97 Beginning Algebra

SAT scores and state guidelines

The SAT consists of two sections, Verbal and Mathematics. Each section has items whose raw scores, when adjusted by SAT testing authorities, range from 200 to 800. The two adjusted

scores are those reported for consideration in the educational environment. Under the State Department of Education's guidelines for admissions, cut-off SAT scores of 375 Verbal and 375 Mathematics are acceptable for high technology program admissions. Figure 1 notes that these guidelines are far below DCC SAT placement level scores which were required for degree level coursework in College English and College Algebra.

Limitations and basic question

Since DCC does not require SAT scores for admission, applicants often do not register SAT scores or dates when it was taken with the institution. Due to data retrieval limitations resulting from this condition, the study was limited to placement levels and SAT scores of DCC students 20 years old and under who were enrolled during the Spring Quarter of 1983. The basic question of this study was: How do admission placement levels of DeKalb Community College students compare with their SAT scores? Below are five sets of REM placement levels and SAT scores that are exemplary of those used in this study.

Placement Levels			SAT Scores	
Reading	English	Mathematics	SAT Verbal	SAT Mathematics
R4	E2	M4	600	590
R1	E4	M2	570	430
R2	E4	M3	420	480
R2	E1	M0	320	360
R3	E3	M1	420	390

Hypothesis

The following null hypothesis was generated in order to provide guidance for the study and to facilitate the statistical treatment of data: There is no significant relationship between REM placement levels and Scholastic Aptitude Test scores of DCC students.

Review of Related Literature

The related literature contains several comparisons of local tests with nationally used instruments, but it is lacking in comparisons of local placement levels with such instruments.

Pedersen (1975) compared grades in freshman Chemistry with SAT scores. For a sample of 325 it was found that performance on the verbal and Mathematics sections of the SAT exhibited low predictive validity in a relation to a criterion of grades in freshman Chemistry.

Marron (1965) compared SAT scores and College Entrance Examination Board (CEEB) achievement tests in Mathematics and English Composition for US Military Academy and Air Force cadets before and after they had attended preparatory schools. SAT scores increased significantly beyond what was considered typical for a senior high school year, but the cadets performed significantly poorer than what was predicted by the CEEB achievement scores, as indicated by an adjusted correlation of .35.

Chang and Brown (1983) compared scores on the Minnesota Reading Assessment (MRA) and scores on the Gates-MacGinitie Reading Test in an effort to establish concurrent validity. With a sample of 56 the results did not clearly establish MRA scores as effective predictors of Gates-MacGinitie scores. The findings suggested further research in more diverse institutional settings with a much larger sample.

These examples of test comparison are augmented by arguments for the use of placement tests for college admissions. Baldwin, (et al, 1975) in a 40 item questionnaire designed to investigate the

variety and scope of developmental Mathematics courses offered at colleges and universities throughout the United States, found that among the 104 respondents 89 percent had developmental Reading, 86 percent had developmental English, and 91 percent had developmental Mathematics. Moreover, only 20 percent of the respondents used SAT scores for placement in Mathematics courses; the remainder recommended Mathematics placement tests. Similarly, in a recent study conducted by the Guidance Information System (1981) only 75 of 1343 (six percent) two-year colleges required the SAT for admissions to their degree programs.

The literature affirms that isolated SAT scores are not generally used by postsecondary institutions for admissions or for placement purposes. According to the Educational Testing Service, SAT scores are not purported to project such depth of perception. When SAT scores are used in admissions procedures, it is recommended that they be used in conjunction with high school grade point averages and high school counseling recommendations.

Methodology

The 1090 cases of this study were retrieved on computer tape by the DCC Administrative Computing Center from the Spring Quarter 1983 Enrollment Files. The large number of cases were used in agreement with testing authorities of The Educational Testing Service who contend that no less than 1000 cases would be valid for this type of study. The cases represent students who were 20 years old and under, they were drawn from all segments of the institution, and they include students from all four campuses.

The sample represents approximately seven percent of all DCC students enrolled in the Spring 1983 Quarter. In all cases the REM Test was administered by the College, and SAT scores were reported on each student's high school transcript.

Statistical procedures

Three statistical procedures were used in order to assess the concurrent validity of REM placement levels with SAT scores. Pearson product-moment correlation coefficients, Spearman Rho rank-order correlation coefficients, and a regression equation were computed at Georgia Institute of Technology's Institutional Studies. All the analyses were conducted by using the subprograms Pearson Correlation, Nonparametric Correlation, and Regression from the Statistical Package for the Social Sciences (SPSS) (Nie, Hull, Jenkins, Steinbrenner, and Bent, 1975).

Results and Discussion

Table 1 shows Pearson correlation coefficients that describe the relationships between SAT scores and their five counterparts noted in the REM placement levels. It can be seen that total SAT scores correlated with total REM placement levels (.76); SAT Mathematics scores correlated with REM Mathematics placement levels (.65); and SAT verbal scores correlated with Combined Reading and English (.71), Reading (.64), and English placement levels (.63).

Table 2 shows Spearman Rho correlation coefficients for the SAT and REM variables. It can be seen that correlation coefficients were found for the same SAT and REM variables in the Spearman Rho correlations, and that there were very little numerical differences

between the Spearman Rho and Pearson correlations. In all cases the correlations met or exceeded the .001 significance level. Based on these observations the null hypothesis was rejected. There appears to be a significant relationship betweeen REM placement levels and SAT scores of DCC students.

Table 1. Pearson Correlations Between REM and SAT Variables (N=1090)

SAT MEASURES	REM MEASURES				
	TOTAL	COMBINED READ. & ENG.	READING	ENGLISH	MATH
TOTAL	.7638	----	----	----	----
MATH	----	----	----	----	.6498*
VERBAL	----	.7070*	.6403*	.6319*	----

*.001 level of significance

Table 2. Spearman Rho Correlations Between REM and SAT Variables (N=1090)

SAT MEASURES	REM MEASURES				
	TOTAL	COMBINED READ.& ENG.	READING	ENGLISH	MATH
TOTAL	.7675*	----	----	----	----
MATH	----	----	----	----	.6368*
VERBAL	----	.7127*	.6599*	.6268*	----

.001 level of significance

Multiple regression analysis

A regression equation was developed to show percentages of variation in REM placement levels that are explained by SAT scores. Table 3 shows that verbal scores on the SAT explain 50 percent of the variation in Combined Reading and English placement levels. Table 4 shows that Mathematics scores on the SAT explain 42 percent of the variation in Mathematics placement levels. In both instances F values were found at the .05 level of significance.

Table 3. Multiple Regression Analysis Between SAT Variables and Combined REM Reading and English Placement Levels (N=1090)

SAT VARIABLE	COMBINED READING AND ENGLISH PLACEMENT LEVELS			
	R	R2	F Value	Significance Level
VERBAL	.7070	.4998	1087.28	.05

Table 4. Multiple Regression Analysis Between SAT Variables and REM Mathematics Placement Levels (N=1090)

SAT VARIABLE	MATHEMATICS PLACEMENT LEVELS			
	R	R2	F Value	Significance Level
MATH	.6498	.4223	795.17	.05

Conclusions and Recommendations

The results of this study clearly establish a significant correlation between DCC REM placement levels and SAT scores. Significant correlations were found for total SAT scores and total REM placement levels, for SAT scores and Combined Reading and English placement levels, and for SAT scores and individual Reading and English placement levels. This was expected because the REM instruments used in these categories are nationally focused with some degree of norming and acceptance. However, the significant correlation between SAT Mathematics scores and Mathematics placement levels is most impressive. It strongly suggests that the Mathematics Placement Test has concurrent validity with the

Mathematics portion of the SAT. In fact, the significant correlation coefficients found in this study for Reading, English, and Mathematics suggest that the REM Test in its entirety has concurrent validity with the SAT.

Recommendations

The findings of this study suggest that other factors of the REM Test and the SAT should be considered. It is recommended that this study be replicated in an effort for further verification which would include the following:

1. A comparison of REM Test scores and SAT scores.
2. SAT scores and REM Test scores reported from a more restricted universe.
3. Development of a scattergram and regression equations to predict REM scores from SAT scores and SAT scores from REM scores.

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